

## Comments and responses on the second and third public meetings to develop TMDLs for bacteria in Cedar and Licking Runs

### Comments from Susan Trumbo (November 17, 2003)

1. The Sub-basin maps which were provided in the handout and displayed at the meeting in a larger form are very difficult to read. There are no common landmarks, such as roads or towns, on the Sub-basin maps for the reader to orient oneself. At the meeting, I observed people having great difficulty locating their property on the large maps on display. Unlike the general public, I have the benefit of having on hand DCR's Hydrologic Units Maps and was able to use these maps to locate your Sub-basins. I am left wondering why DEQ does not provide information to the public in a user friendly format.

*DEQ makes every effort to provide information to the public in a format they can use. A map of the watershed showing major roads and towns was included in the DEQ presentation. The primary purpose of the Sub-basin maps in the NVRC presentation was to convey information being used by the model. The large size of the watershed makes it impossible to display roads and towns on every map without obscuring some of the information we are trying to convey. The large paper maps that were on display at the public meeting had selected town and street names on them to help orient the viewer.*

2. It was stated that the actual waterflow on Licking Run and Cedar Run is less than the model's projected flow. There was no mention made that your model included a factor for evaporation loss from the flood control lakes on Licking Run and Cedar Run.

*The Hydrologic Simulation Program – Fortran (HSPF) does include a factor for evaporation from water surfaces and this factor was used in the calibration. Because no information was available on outflows from the dams, the reservoirs could not be explicitly modeled and were instead modeled as streams.*

3. It was stated that actual waterflow patterns on Licking Run does not meet the model's projected waterflow patterns. Since construction of the Germantown Dam, waterflow on Licking Run is unnatural and after ten years still unpredictable.

*DEQ is aware of the unnatural flow pattern on Licking Run. An attempt was made to account for unusually low flows by simulating agricultural irrigation withdrawals, but we were unable to quantify these withdrawals. The best calibration possible was done with the available information, and the summary statistics for both the calibration and validation fall well within accepted criteria for every condition except the lowest 50% of flows.*

4. The list of VPDES Permitted Point Sources does not include the municipal sewage treatment plants of Warrenton or H. M. Pearson Elementary School.

*The Warrenton Town Sewage Treatment Plant (VA0021172) discharges to Great Run in the Rappahannock River watershed. The Pearson Elementary School (VA0027278) has been added to the source assessment.*

5. I question the accuracy of your evaluation of the Sources of Bacteria for the watershed. It is obvious that Cedar Run Watershed does not meet the normal population densities for Virginia you stated were used to develop the model. I realize that one purpose of the public

information meeting was for DEQ to gather better information on the Sources of Bacteria from the watershed residents.

*The human population and housing unit estimates were made using 2000 Census data and represent the population of the watershed as reported in census blocks located in the watershed.*

6. The Trumbo Family farm is located in Sub-basins 6, 8 and 9 with the majority of our land in Sub-basin 9. I offer the following observations on our location: I am unaware of any dwelling or drainfield being located in Sub-Basin 8.

*The model segmentation was changed after the second public meeting. Sub-basins 6 and 8 were combined with sub-basins 2, 3 and 7 to form a new sub-basin 4. The total number of housing units in the new sub-basin 4 is 1,638. As mentioned in the previous response, housing units were estimated using 2000 Census data, which includes location information to the census block level.*

7. For Sub-Basin 9:
  - I suggest there are many more than your estimate of 1 failing septic in Sub-Basin 9. Locations of failing drainfields are not limited to the village of Catlett and Calverton. Also, there are numerous houses with gray water lines.
  - Your dog estimates should be doubled.
  - Your beef cow estimates should be tripled.
  - It is unclear from your presentation if the steer and heifer estimates are dairy cattle or beef cattle. If they are beef cattle, the number should be tripled. I am unaware of any dairy cattle in Sub-Basin 9.
  - I estimate there are at least 75 horses in Sub-Basin 9.
  - There are no estimates for the various exotic, livestock pets which reside in Sub-Basin 9. Many of these are kept in paddocks denude of any grass. There is little room on the property for proper management of the manure produced from the pets.
  - Your wildlife estimates for Sub-Basin 9 are seriously low.
    - On Licking Run, between the Cedar Run Bridge on Rt 806 and Licking Run Bridge on Rt 616 there are more than a dozen beaver dams. Several beaver colonies are located on marshy areas within a mile of Licking Run. I can not imagine that five beavers would be able to maintain the numerous dams and huts which exist in Sub-Basin 9.
    - The turkey and deer estimates are conservative.
    - Your information shows no waterfowl in Sub-Basin 9. However there are numerous native waterducks and heron in year-around resident on Licking Run. Last Wednesday, there were 60 waterducks on our farm pond. In addition we have hundreds of Canadian geese in resident each winter.
    - There are no population estimates for fox, possum, skunk, coyotes or bear, all of which reside in the area.

*The model segmentation was changed after the second public meeting. Sub-basin 9 was renamed sub-basin 6.*

- *While the estimates of failing septic systems in the Cedar Run watershed were developed in cooperation with Health Department officials, DEQ recognizes that these estimates may be low. Regardless of their relative contribution, DEQ recommends addressing sources of human waste first in implementation, as these sources are the*

*most likely to pose a significant threat to human health and are the easiest to control. The following text appears in the implementation section of the TMDL:*

*"In the Licking and Cedar Run watersheds a number of failing septic systems have been documented over time. While the loads in by themselves do not constitute a majority of the contamination problem, they do represent a potentially serious health issue. Additionally, the majority of the systems currently installed are becoming aged and it is anticipated that left unchecked the potential for contamination will only increase with time. The staged implantation efforts should address these septic issues concurrently with the agricultural issues."*

*The Health Department has identified gray water, water that has been used in the home except for toilets, as a potentially significant source of bacteria. DCR has costshare money available to correct gray water lines.*

- *The number of dogs in sub-basin 9 (now sub-basin 6) was increased from 25 to 48.*
- *The estimate of 50 beef cattle in sub-basin 9 was provided by TAC representatives from the Fauquier County Virginia Cooperative Extension and the John Marshall Soil and Water Conservation District. This estimate was not changed in order to maintain consistency of agricultural source distribution throughout the watershed.*
- *Steers and heifers were effectively represented as beef cattle in the model, and no dairy cattle were simulated in Sub-basin 9. Steers are castrated bull calves less than one year old, while heifers are females that have not yet calved. The estimates were provided by TAC representatives and were not changed in order to maintain consistency of agricultural source distribution throughout the watershed.*
- *The estimate of 75 horses in sub-basin 9 was provided by TAC representatives and was not changed in order to maintain consistency of agricultural source distribution throughout the watershed.*
- *Estimates could only be developed for commonly owned types of livestock for which bacteria production rates are available in the literature. It is not feasible to try to include every type of livestock when the vast majority of the manure (and bacteria) produced by livestock in the watershed is attributable to only a few kinds of animals.*
- *As was mentioned at the public meeting, the wildlife numbers were estimated based on preferred habitat type and typical animal densities within their preferred habitat type. No specific studies have been done to look at wildlife densities in the watershed, however the wildlife numbers used have been used in other TMDLs developed for the Northern Virginia region. Estimates could only be developed for common types of wildlife for which bacteria production rates are available in the literature. It is not feasible to try to include every type of wildlife when the vast majority of the waste (and bacteria) produced by wildlife in the watershed is attributable to only a few kinds of animals.*

8. *I hope that my comments will be included in your review of the watershed. Assuming that there are similar errors in the population estimates for the other Sub-Basins, I hope other landowners in the watershed will comment on your presentation. Without comments and input from the landowners in the watershed you will not have the necessary information to develop a model which accurately portrays the Cedar Run and Licking Run Watershed.*

*We appreciate your thorough review of the bacteria source estimates in the watershed and your comments on sub-basin 9 in particular. We have addressed your comments wherever possible, keeping in mind the need to treat sub-basins across the watershed as consistently as possible. We look forward to your continued participation in the TMDL process.*

Comments from Fauquier County Water and Sanitation Authority (November 20, 2003)

1. We request an appropriate wasteload allocation in the TMDL for a treatment plant with a design flow of 300,000 gallons per day. Consistent with DEQ's standard practice, we also request appropriate provisions in the TMDL to support the potential future expansion of the plant (subject, of course, to effluent limitations providing for full compliance with bacteria standards at end of pipe).

*DEQ enthusiastically supports FCWSA's efforts to address the longstanding problems with straight pipes and failing septic systems in the Cedar Run watershed. A scenario representing the addition of a 300,000 gallon per day facility will be included as an appendix to the TMDL. A scenario representing current discharges at five times their current flows will also be included as an appendix to the TMDL in order to support future growth in the watershed, in accordance with DEQ guidance for bacteria TMDLs. We appreciate your participation in the TMDL process and look forward to continuing to work with you as we develop allocations and move to the implementation phase.*

Comments from Susan Trumbo (April 14, 2004)

1. First – the watershed assessment does not correctly represent the actual population of the watershed. Accurate and recent data available on the watershed has been disregarded. Public comment has been ignored. Population and bacteria sources were selected which would provide the predetermined model results.

*It is unfortunate that you perceive the results of the TMDL study to have been predetermined. Nothing could be further from the truth and every effort was made to assemble a credible data set. Some changes have been made in the TMDL report to reflect some of the concerns you and others raised during the final public meeting. However, based on the results of nearly 80 previously completed bacteria TMDLs, almost complete reduction of all anthropogenic bacteria entering the stream, including human sewage, livestock, and pets, will be needed for us to meet our water quality goals.*

2. Second – insufficient data is available to properly conduct a statistically accurate model according to accepted and recognized standards. A little leg work and a lot of common sense would have produced a more accurate watershed bacteria allocation.

*EPA guidelines and the Consent Decree signed by EPA and Virginia in 1999 require the development of TMDLs on a prescribed schedule using the best available data. The Cedar Run and Licking Run TMDLs were developed using this guidance. The tool used to determine the TMDL allocations for Cedar Run and Licking Run is a watershed-based modeling package called HSPF. This tool allows the continuous simulation of watershed processes based on widely accepted empirical equations. These equations are applied in an iterative fashion to simulate the hourly condition of a watershed over a multi-year period, with the output from the previous hour becoming the input to the next hour, providing a continuous simulation. Both the water cycle and bacteria fate and transport were simulated over a three-year simulation period that included a range of climatic conditions, yielding results within accepted levels of modeling accuracy. Unlike a statistical model, which aims to find a statistical relationship between one or more parameters, the goal of HSPF is to represent continually occurring natural processes over time. Bacteria source estimates and*

*watershed characteristics were developed using accepted standards of practice, best professional judgment, and input from the Technical Advisory Committee (TAC).*

3. Third – the draft Executive Summary provided on March 23, 2004 is riddled with inaccurate and invalid statements. I am astounded that persons would set aside their professionalism and credibility and allow their name to be associated with this document.

*The report and associated Executive Summary presented at the final public meeting were in draft form. They have been reviewed for errors and accuracy and corrections have been made where appropriate.*

4. DEQ has missed a great opportunity to utilize the resources available locally and statewide to improve state waters. These errors will be compounded by the future investment in implementation of your plan. I am unconvinced that you have identified the bacteria. Sadly, upon completion of the TMDL Process, our state waters will not be any cleaner as a result of your efforts and our capital expenditures.

*As you may know, DEQ recently identified over 1,200 waters as impaired by various pollutants. EPA and the states are using the TMDL process to develop and define the "action plan" for identifying pollutant reductions necessary for the attainment of water quality goals in these impaired waters. In fact, DEQ's Water Board is currently approving completed TMDLs as the plans for making these pollutant reductions. Please be assured that we are very serious about utilizing the TMDL program to restore water quality and work hard at developing meaningful TMDLs that will result in cleaner state waters.*

*While the TMDL report presents as comprehensive a picture of watershed pollutant sources as possible, it can only be a snapshot in time and should not be considered a static document to be rigidly followed. Indeed, the concept of adaptive management, or staged implementation, has been incorporated into Virginia's TMDL process to allow continuous review and updating of the corrective measures needed to reduce pollutant loads.*

*It is very important for the watershed stakeholders and all levels of government to work together toward the goal of ensuring the water resources of the Commonwealth are restored and protected. We are dedicated to achieving that goal in the most reasonable, productive, and cost-effective means possible.*

#### Comments from Fauquier County Water and Sanitation Authority (April 15, 2004)

1. Consistent with DEQ Guidance Memo No. 03-2015 (Method for Representing WLAs in Bacteria TMDLs), include a matrix of scenarios under which the cumulative design flow for the currently permitted point sources in the watershed is increased by one or more multipliers up to a factor of five. FCWSA requests the addition of a matrix applying a multiplier of five to all point source design flows, including the design flow for the Quantico STP.

*DEQ regrets that this appendix was not available for review at the March 23 public meeting because we were still working to resolve concerns about applying this approach in the Occoquan watershed. Those concerns have since been resolved and an appendix has been added to the TMDL showing the impact of increasing the cumulative design flow for the currently permitted point sources in the watershed increased by a factor of five has been*

*added to the TMDL. Inclusion of this appendix will allow for future expansions of existing sources without revisions to the TMDL.*

2. Add a WLA ("FCWSA – Cedar Run") to accommodate the permitting, construction and operation of [...] a new treatment plant with a design flow of 440,000 gpd in the Cedar Run sub-basin.

*DEQ regrets that this appendix was not available for review at the March 23 public meeting because we were still working to resolve concerns about applying this approach in the Occoquan watershed. Those concerns have since been resolved and an appendix has been added to the TMDL showing the impact of adding an additional 300,000 gpd capacity to the existing Quantico permit, for a total design flow of 440,000 gpd, as was requested in a November 2003 comment letter from FCWSA.*

#### Comments from Prince William County (April 16, 2004)

1. The bacteria contribution from the pet sources was found to be approximately 30% at Cedar Run 1ACER006.00 station in the DEQ study, whereas, the Prince William County study showed no pet contribution. We hereby request DEQ to take a second look at the contribution from pets by verifying its testing methods, as well as, by determining whether the pet population revealed by the test results is realistic for the Cedar Run Watershed.

*DEQ is aware of the discrepancy between the state and county BST results and plans to investigate the causes of this discrepancy in the coming months. The DEQ BST data were used only to verify the presence or absence of sources identified in the watershed source assessment, and not to quantify these sources or to establish allocations. BST is a relatively new and rapidly evolving science. The potential for BST to provide significant insight into the nature and magnitude of sources affecting instream water quality warrants further development of this science.*

2. We understand that actual BST sampling data was not used as a cross reference for the TMDL modeling due to the discrepancies highlighted above. The lack of a cross reference for the model may result in erroneous load allocations from different sources when the TMDL is developed.

*Dozens of TMDLs have been established throughout the state using the same tools and approach as were used in Cedar Run. DEQ acknowledges the uncertainty associated with TMDL development and advocates a staged approach to implementation to help manage this uncertainty. Under staged implementation, the TMDL is considered a best estimate of significant sources and the reductions required to restore water quality. Best Management Practices (BMPs) are selected that will provide the most cost-effective reduction in bacteria delivered to the stream. Monitoring before and after BMP installation allows the tracking of changes in water quality and the evaluation of the effectiveness of the TMDL in attaining water quality standards. Ultimately, the measure of success of the TMDL is the attainment of instream water quality standards, and not of the percent reductions required to meet TMDL allocations.*

3. The land use information used in the TMDL model was taken from 2000 land use data. Significant changes in land use has occurred in the Cedar Run watershed in recent years. Many farm lands are being developed as residential properties. The changes in the land

use, as well as, the ongoing implementation of conservation plans by farmers, not reflected in the TMDL model, will result in inaccurate TMDL load allocations.

*The land use data used in the model was the most recent data available at the time of TMDL development. DEQ recognizes that portions of the Cedar Run watershed are rapidly changing and has included the attached text in the implementation section of the TMDL to ensure that these changes are considered during Implementation Plan development:*

*“Because this watershed is currently undergoing a transformation from an agricultural dominated land use pattern to an urban land use, it is anticipated that the sources of contamination will shift over time. As such the staged implementation plan will allow for flexibility in addressing the prevalent sources. Similarly within the agricultural community the prevalence of a milk based cattle population is being supplanted by a beef based population which may require different implementation efforts.”*

4. We are concerned that the human signature, failing septic systems, has not been properly represented in the model.

*While the estimates of failing septic systems in the Cedar Run watershed were developed in cooperation with Health Department officials, DEQ recognizes that these estimates may be low. Regardless of their relative contribution, DEQ recommends addressing sources of human waste first in implementation, as these sources are the most likely to pose a significant threat to human health and are the easiest to control. The following text appears in the implementation section of the TMDL:*

*“In the Licking and Cedar Run watersheds a number of failing septic systems have been documented over time. While the loads in by themselves do not constitute a majority of the contamination problem, they do represent a potentially serious health issue. Additionally, the majority of the systems currently installed are becoming aged and it is anticipated that left unchecked the potential for contamination will only increase with time. The staged implementation efforts should address these septic issues concurrently with the agricultural issues.”*

5. To resolve these issues, Prince William County recommends a coordination meeting with DEQ staff Virginia Tech staff. We strongly feel that this step is essential in order to establish credible TMDL load allocations for bacteria from different sources.

*DEQ met with Prince William County and NVRC to discuss differences in the BST results of the state and county studies on February 27, 2004 and will be glad to meet with the County again to discuss these issues further. In addition, a follow-up meeting to the final public meeting was held with the TAC, of which Prince William County is a member, on April 12, 2004 to further discuss the process and data used to develop the TMDL. Language has been added to the TMDL to address some of the issues raised by the County at the April 12 TAC meeting.*

*The consent decree deadline requires submittal of the Cedar and Licking Run bacteria TMDLs to EPA by May 1, 2004. DEQ contends that the proposed TMDL allocations were developed using the best available information and tools, and that a staged approach to implementation will allow evaluation of the TMDL while ensuring that steps are taken to improve water quality as quickly as possible. DEQ encourages Prince William County to participate in the development of an implementation plan for the Cedar and Licking Run*

*TMDLs and looks forward to coordinating with Prince William County on this endeavor as well as on the upcoming investigation into differences between state and county BST data.*